

CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

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THE APPRAISAL OF CONTENT IS TENTATIVE.  
(FOR KEY SEE REVERSE)

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REPORT [REDACTED]

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SUPPLEMENT TO  
REPORT [REDACTED]

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COUNTRY : USSR (Kalinin Oblast)

SUBJECT : Additional Information on Rocket Fuel  
Research at Podberezye.PLACE  
ACQUIRED [REDACTED]DATE  
ACQUIRED [REDACTED]

DATE OF IN [REDACTED]

THIS IS UNEVALUATED INFORMATION

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1. [REDACTED] the highest and lowest service temperatures imposed on these materials used for gaskets, hose, protective coatings, etc., in the 346 aircraft [REDACTED]

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The highest and lowest temperatures were determined by the characteristics of the sealing material. Minus 40° C. was determined as the lowest temperature and 60° C. as the highest. These temperatures depended on the utilization of Oppanol-Lupolen mixtures and were principally used as sealing material for T-Stoff. Similar conditions held true for sealing materials for C-Stoff and a rubber base used. Initially these materials were compounded according to [REDACTED]. These samples consisted of Oppanol-Lupolen mixtures. The Lupolen corresponds to American pullicin (polyethylene) and was initially imported from America. The time of development required was about 1 1/2 years [REDACTED]

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2. [redacted] effort and money [redacted] devoted to the development of these materials [redacted]

There is little [redacted] concerning the financial side of the development since [redacted] received only minute samples for testing purposes.

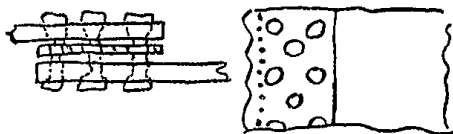
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3. Previous reports tell of nitric acid tank construction for rocket aircraft. [redacted] composition aluminum [redacted] the riveted seals with a diagram. [redacted] they prevent leaks due to torsional and vibrational stresses [redacted]

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The containers for nitric acid were made only as experimental tanks. They were tanks of about 30 cm. diameter and approximately 50 cm. high. These were riveted together and subjected to a testing pressure of about 3 atm. A material similar to dural was used as work material and was plated with pure aluminum to about 0.3 mm. thickness. The rivet pattern used was:



With this type of riveting, the important principle was that the rivets be as close to each other as possible in order to avoid indentions that would cause leakage. No completed aircraft tanks were made. Experiments were conducted, testing the riveted joint under various pressures. Certain leaks appeared but abated after a short time. Sealing material between the riveted plates was polyvinylchloride sheeting painted with oppanol solution. These tanks were tightly closed for the experiments with nitric acid, so that no pressure loss could occur, and then checked as to their pressure by means of a gauge.

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4. Information on the production of transmission and motor oils by styrene polymerization at the Buna plant is requested. [redacted] water-oil emulsion type lubricants being made [redacted]

Lubricating oils, [redacted] are not made from styrene but rather from ethylene. [redacted] cannot give information as to amount. This is also true for water-oil emulsion lubricants; [redacted]

5. [redacted] investigating the cause of reddish-brown precipitate in C-Stoff, [redacted] the precipitate [redacted] analyzed to find out its composition [redacted]

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- This was not necessary since the group easily solved the reason for its occurrence without the necessity of analytical methods and reason of occurrence was the primary problem. As stated before [ ] the consensus of opinion was that the precipitate was either copper or  $\text{CuH}_2$ . 50X1-HUM
6. [ ] C-Stoff concocted at Podberezye [ ] arrive in oil drums already mixed [ ] the 10 tons of "material" consumed in testing hydrazine hydrate or C-Stoff [ ] this 10 tons, which [ ] were [ ] of Soviet manufacture and [ ] of German manufacture [ ] 50X1-HUM
- The chemical laboratory mixed C-Stoff as required for tests. The 10 tons of material referred to was hydrazine hydrate. [ ] unable to recall what percentage of this material was of Soviet manufacture.
7. [ ] USSR-manufactured hydrazine hydrate first utilized at Podberezye [ ]
- Soviet hydrazine hydrate was introduced about 1948. Exact date of termination of any phase of research and testing is nebulous because other activities were occurring in the laboratory at the same time. [ ] the material was of Soviet manufacture and [ ] it was delivered in Soviet trucks. The type of containers used was different in shape from the German type. In addition, a Soviet, who identified himself as coming from the plant which produced the material, came to Zavod No.1 and questioned [ ] its quality. The reference to "original stocks" indicates raw material and C-Stoff. These came from captured German supply dumps. It is somewhat difficult to ascertain German World War II supply channels at this time. However, two of the largest plants for manufacture of hydrazine hydrate were at Leverkusen and Gerstofen. The impurities in these stocks are not recalled but were of minute account. 50X1-HUM
8. [ ] Give a breakdown of the consumption of hydrazine hydrate by year and end use, such as engine test, rocket plane flight, analytic tests, etc. [ ] exact dates for flight tests for the DSF 346. 50X1-HUM
- It is impossible to give a breakdown of hydrazine hydrate consumption by year and test due to the lapse of time and memory. The 346 was not produced in any extensive number and it probably is not intended to do so later, since the 346 represented a purely experimental type aircraft. One model was produced and flown on 15 or 16 September 1951. It crashed during the flight. No other models were made. 50X1-HUM
9. [ ] the statement that the Soviet-manufactured hydrazine hydrate contained free hydrazine [ ] this free hydrazine was obtained in the manufacture, since an aqueous solution of hydrazine yields the hydrate and water on distillation [ ] 50X1-HUM

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[redacted] statement "hydrazine hydrate contained free hydrate" stands as stated. In one process of manufacture, a dilute solution of hydrazine in water is formed. The solution is evaporated to hydrazine hydrate rather than distilled. Such a process is used at the Mathieson plant at Lake Charles, Louisiana. It is not known whether the Soviets used such a process or not. The material so produced may be further processed into anhydrous hydrazine by azeotropic distillation.

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[redacted] free hydrazine did exist in the hydrate.

10. [redacted] pyrocatechin used by Germans or Soviets of Podberezye [redacted] to prevent precipitation in C-Stoff [redacted]

a. [redacted] the source of pyrocatechin, [redacted] name and location of plant from which it was received.

b. [redacted] quantities [redacted] pyrocatechin available [redacted]

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b. Requirements of the chemical section were small and therefore availability of large quantities unjudgeable.

11. [redacted] in the fall of 1949 the Soviets introduced their own manufactured T-Stoff. [redacted] the Soviets switched from German to Soviet-manufactured hydrazine hydrate. [redacted]

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T-Stoff is the code name for 80 per cent hydrogen peroxide ( $H_2O_2$ ). Hydrazine hydrate has the formula  $N_2H_4 \cdot H_2O$ . Since there is no contradiction in the two statements, both are correct.

12.

13.

[redacted] instruments constructed by TYBUS for delivery to Moscow. Also, [redacted] plant number and institute name in Moscow which received the instruments.

See [redacted] for a drawing and description of a hypergolic delay instrument developed at Ostashkov. The instruments constructed at Zavod No. 1 were for all practical purposes identical with the one previously reported. Instruments to measure consistency (viscosity is an unrealistic term here) of the thixotropic Kraftstoff "A" were built. They were similar to instruments

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used in [ ] i.e., a falling ball, a paddle viscosimeter, etc. [ ] It is not believed that detailed descriptions would prove of any value. The name of the institute in Moscow is unknown.

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14. [ ] the exact stage of "production of  $B_2H_6$  and  $B_4H_{10}$ ." A detailed description similar to that given of the development of Kraftstoff "A" in [ ] is desired.

[ ] Give the title, date, periodical and author for all publications. [ ] Germans able to keep their development of boronhydrides from Soviets since ten Soviets worked in the laboratory with these Germans [ ]

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[ ] cannot recall the title and publication date of [ ] publications referred to.

15. Give details of development of polyamides and intended applications to include intermediate raw materials and processes of and place of manufacture. Type of polymerization processes, characteristics of the polymer in comparison to standard type or known polyamides.

16. Give also complete details on the development and intended application of the mixed Buna and plastic materials (Polystyrene and/or polyvinylchloride). [ ] polychlorstyrene, chlorinated polyvinylchloride or chlorinated Buna included in this development program [ ]

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17. [ ] Lukhovitsy airfield.

The nearest railroad station to Lukhovitsy airfield was at Kolomna and the airfield was approximately 30 km. due south of the station. It was approximately 150-180 km. southeast of Moscow.

18. [ ] work on the Ju-2-88 continue [ ]

Work continued on the 2-88 until the end of 1947 or beginning of 1948. BAADE was in charge of design of the EF-150. HOFFMANN was the pilot assigned to test it. It was not flown at Zavod No. 1, since there was no airfield available, but was disassembled, loaded on a Volga River barge and taken to an unknown location for flying. GUENTER worked under RASCHIG and did a lot of project work which went to Moscow and it was rumored that these projects were connected with the MIG-15. There is no concrete evidence of this fact, however.

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